

Appl. No. 10/780,714

Amendment dated: January 11, 2006

Reply to OA of: December 12, 2005

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1(original). A carbon substance comprising:

a structure having a size ranging from about 1 μm to about 100 μm and including carbon and a metal or a metallic oxide; and

a plurality of line-shaped bodies whose diameters are smaller than about 200nm,

wherein the line-shaped bodies include carbon as a main component thereof and grow radially from a surface of the structure.

2(original). A carbon substance comprising:

one or more structures, each having a size ranging from about 1 μm to about 100 μm and including carbon and a metal or a metallic oxide; and

one or more line-shaped bodies whose diameters range from about 50nm to about 1 μm ,

wherein the line-shaped bodies include carbon as a main component thereof and grow from surfaces of the structures.

3(original). The carbon substance of claim 2, wherein each of the line shaped bodies further includes a particle containing at least a metal or a metallic oxide.

4(original). The carbon substance of claim 2, wherein the line-shaped bodies include bodies connecting the structures.

5(original). The carbon substance of claim 2, wherein the line-shaped bodies include at least one body starting from and returning to a same structure.

6(original). A method for manufacturing a carbon substance by a thermal decomposition of a source gas containing carbon in the vicinity of a catalyst,

wherein the catalyst comprises a first and a second materials, the first material being Ni or a Ni oxide and the second material being In or an In oxide; and the thermal decomposition is performed at a temperature ranging from about 675°C to about 750°C, and

wherein the carbon substance comprises a structure having a size ranging from about 1µm to about 100µm and including carbon and a metal or a metallic oxide and a plurality of line-shaped bodies whose diameters are smaller than about 200nm, the line-shaped bodies including carbon as a main component thereof and growing radially from a surface of the structure.

7(original). A method for manufacturing a carbon substance by thermal decomposition of a source gas having carbon in the vicinity of a catalyst,

wherein the catalyst comprises a first material and a second material, the first material being Ni or a Ni oxide and the second material being In or an In oxide; and the thermal decomposition is performed at a temperature ranging from about 550°C to about 700°C, and

wherein the carbon substance comprises one or more structures, each having a size ranging from about 1µm to about 100µm and including carbon and a metal or a metallic oxide and one or more line-shaped bodies whose diameters range from about 50nm to about 1µm, the line-shaped bodies including carbon as a main component thereof and growing from surfaces of the structures.

8(original). An electron emission element which emits electrons from an electron emission material by using a voltage difference between a first electrode and a second electrode, wherein the electron emission material is arranged on the first electrode and the second electrode is arranged facing the electron emission material,

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wherein the electron emission material comprises the carbon substance of claim 1.

9(original). An electron emission element which emits electrons from an electron emission material by using a voltage difference between a first electrode and a second electrode, wherein the electron emission material is arranged on the first electrode and the second electrode is arranged facing the electron emission material, and

wherein the electron emission material comprises the carbon substance of claim 2.

10(original). The electron emission element of claim 9, wherein the line-shaped bodies of the carbon substance are divided to direct in a radial manner.

11(original). A composite material comprising the carbon substance of claim 1 in its matrix.

12(original). A composite material comprising the carbon substance of claim 2 in its matrix.

13(new). A method for manufacturing the carbon substance of claim 1 by a thermal decomposition of a source gas having carbon in the vicinity of a catalyst,

wherein the catalyst comprises a first and a second materials, the first material being Ni or a Ni oxide and the second material being In or an In oxide; and the thermal decomposition is performed at a temperature ranging from about 675°C to about 750°C.

14(new). A method for manufacturing the carbon substance of claim 2 by a thermal decomposition of a source gas having carbon in the vicinity of a catalyst,

wherein the catalyst comprises a first material and a second material, the first material being Ni or a Ni oxide and the second material being In or an In oxide; and the

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thermal decomposition is performed at a temperature ranging from about 550°C to about 700°C.